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(54) Abstract Title
Using multi-dimensional databases to store and retrieve data linking family, social, local and geographic groups of users

(57) Nuclear family ties, social identity, local groups and geographic proximity are important in patterns of human and electronic communication. Yet individuals are members of a multitude of groups, separate and overlapping. Such factors are underrepresented in electronic addressing schemes. Using categorisation cycles, the current invention links databases of different groups, categories and content via structured, iterative, representational frameworks for ease of creation, maintenance and navigation by users. In any electronic addressing schema there are differing requirements for privacy and for locality identification. This method structures multidimensional representations to tie together individuals, groups and physical, social and virtual communities and their multiple communications, content and interaction requirements. This method provides co-ordination of physical with electronic addresses with in addition a third schema of public addresses with non-physical associations. This ensures competing requirements of privacy and proximity is achieved, without losing benefits of knowing physical locations for those with a legitimate need.

Figure 11

Navigation Around Groups and Multiple-Groups

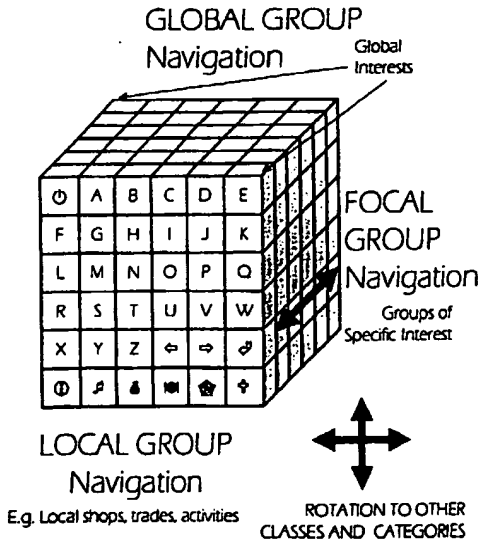

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Figure One

Dimensions of Group Membership
and Associated Information Stores and Databases

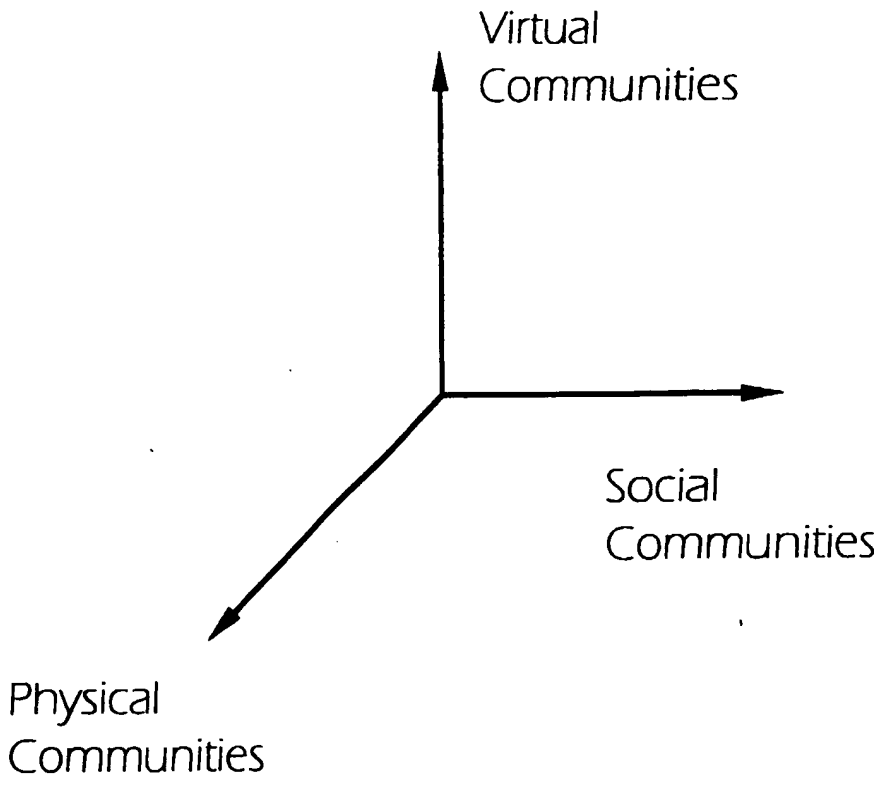
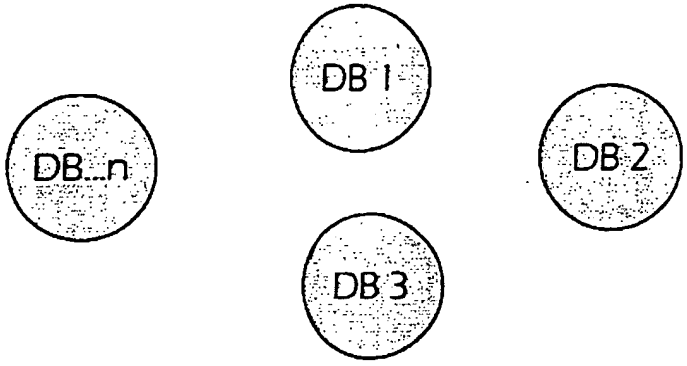


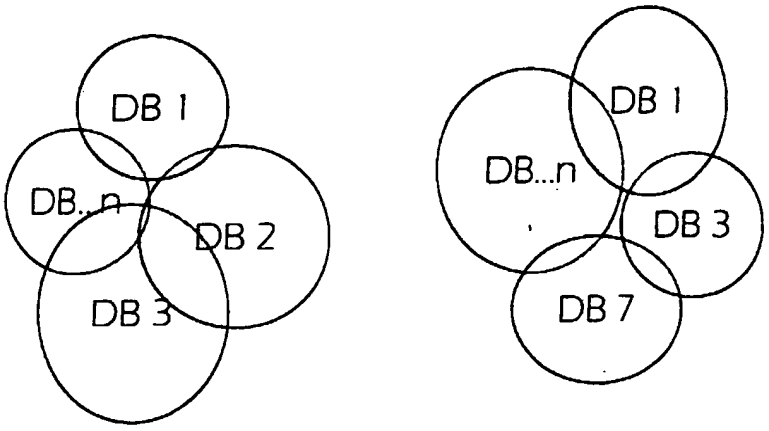
Figure 2

Separate and Overlapping and Linking Groups
and their associated Databases

Single Database Perspectives
no linking and no differential importance



Multiple Database Perspectives - Overlaps,
linking and relative importance



Person 1

Person 2

Figure 3

Multiple memberships and
Subordinate and Superordinate Groups
Created by Cyclical Categorisation

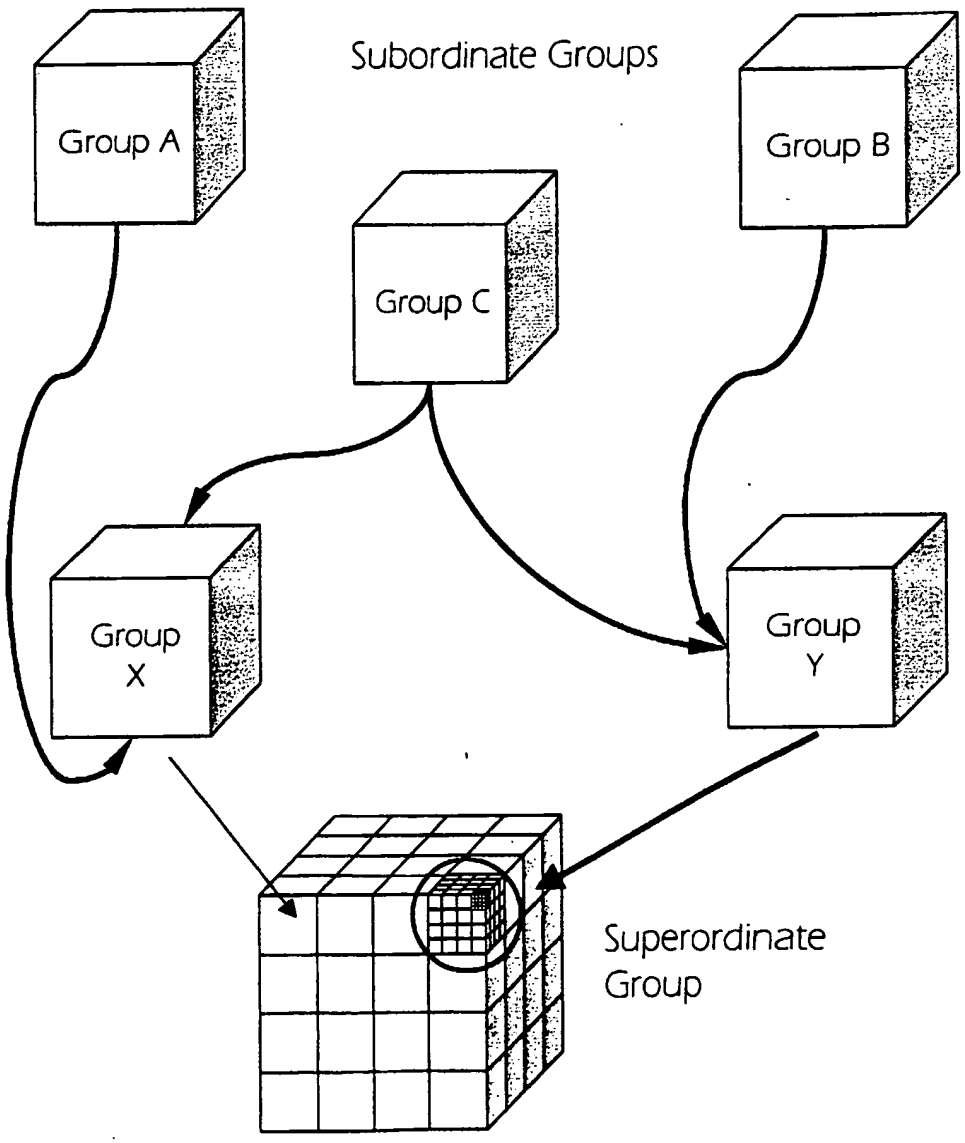
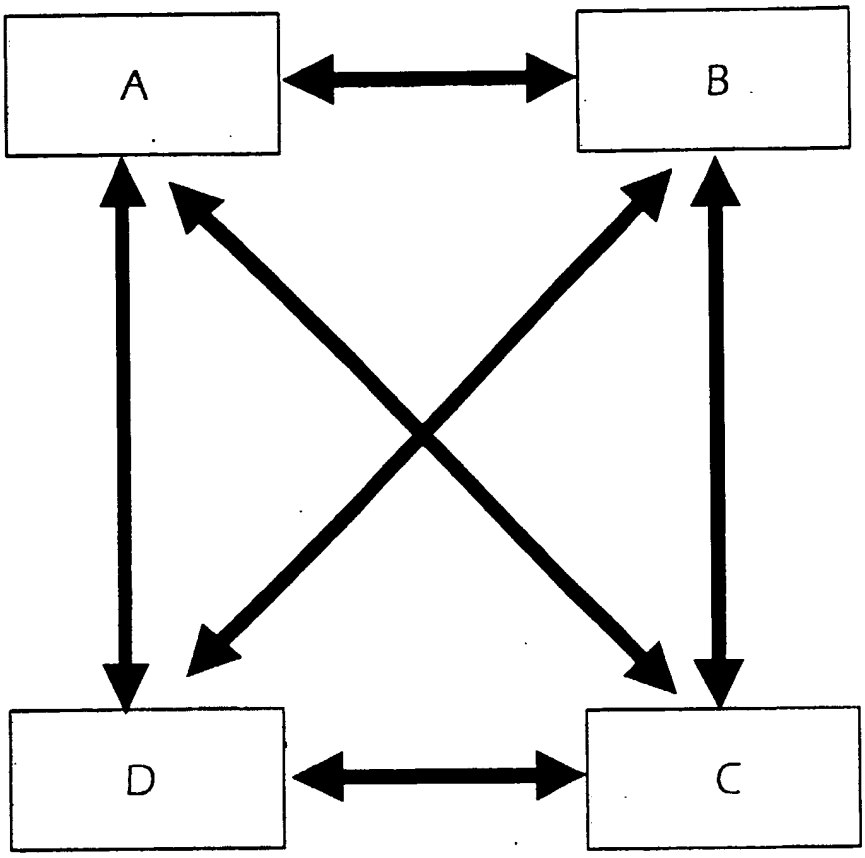


Figure 4

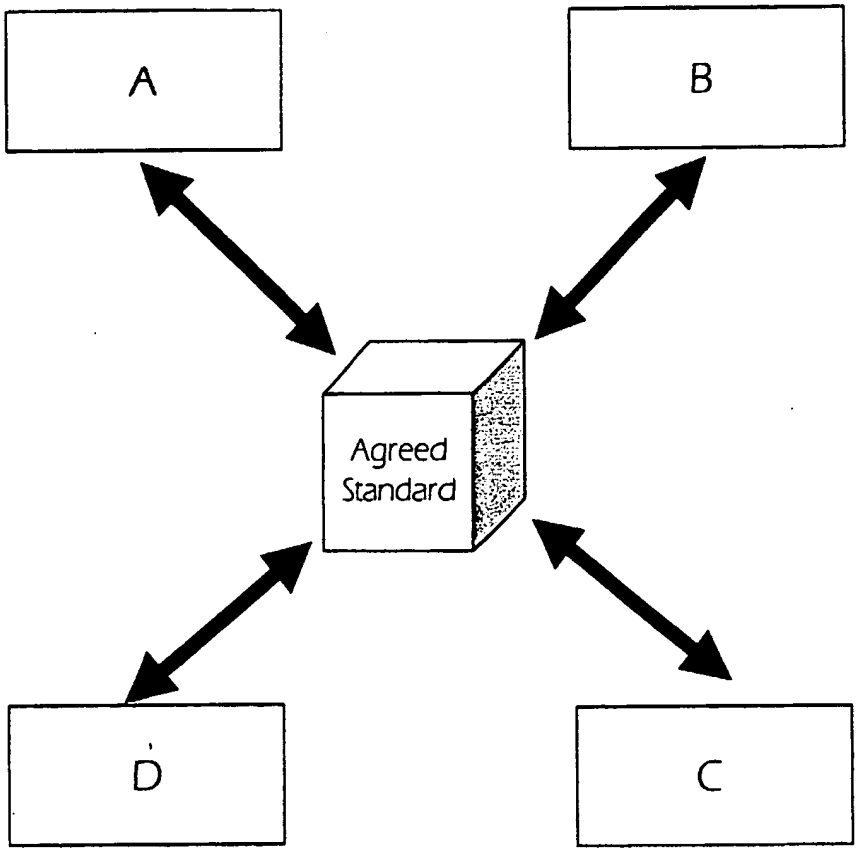
Inter- Database Co-ordination without a standard interchange interface



Involves increasing complexity of information interchange as database and data store numbers increase

Figure 5

Inter-Database Co-ordination with a
Standard and Agreed Interchange Interface



Simplification of Interchange as data
content, databases and data stores increase

Figure 6

Some Dimensions of Data Stores of Information

"Events"

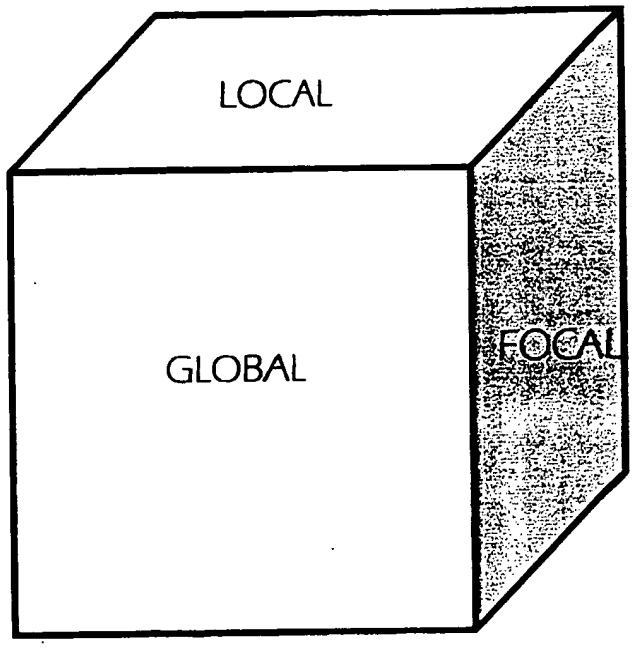
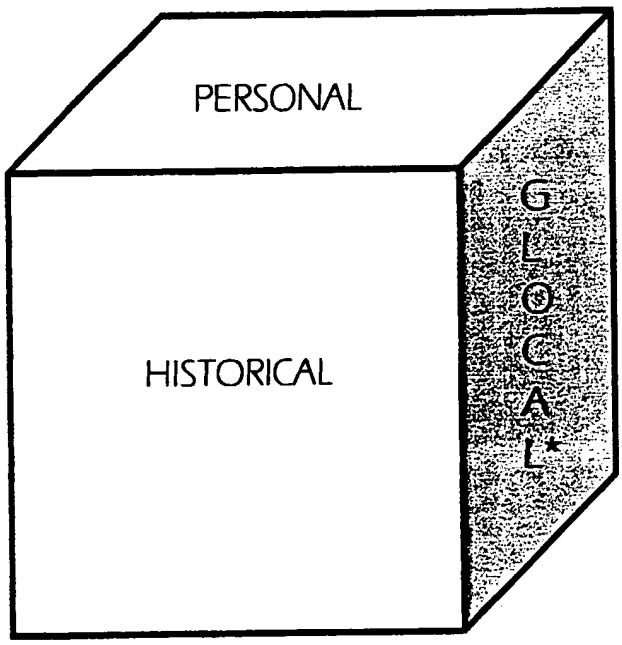


Figure 7

Some Dimensions of Data Stores of Involvement

"Experiences"



*GLOCAL is

GOALS
LIFE EVENTS
OPPORTUNITES
COMMUNITIES

Figure 8

Some Dimensions and Data Stores of Action

"Activities"

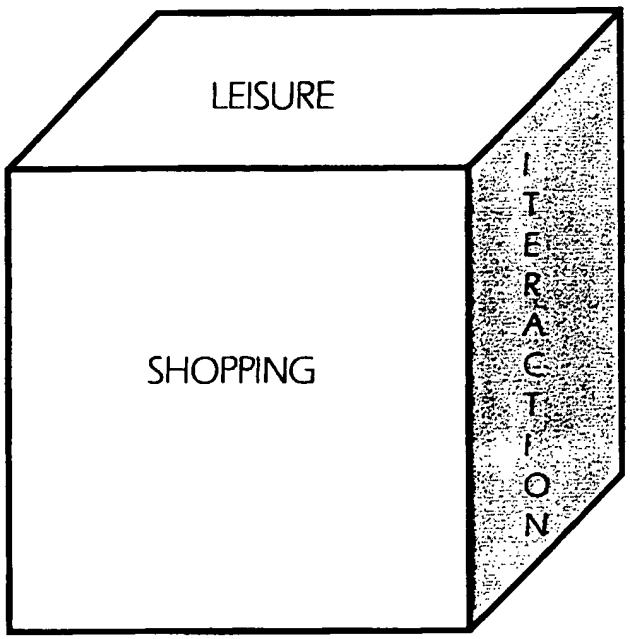


Figure 9 9/18

One Example View of Dimensions, Groups and Data Store Interrelationships

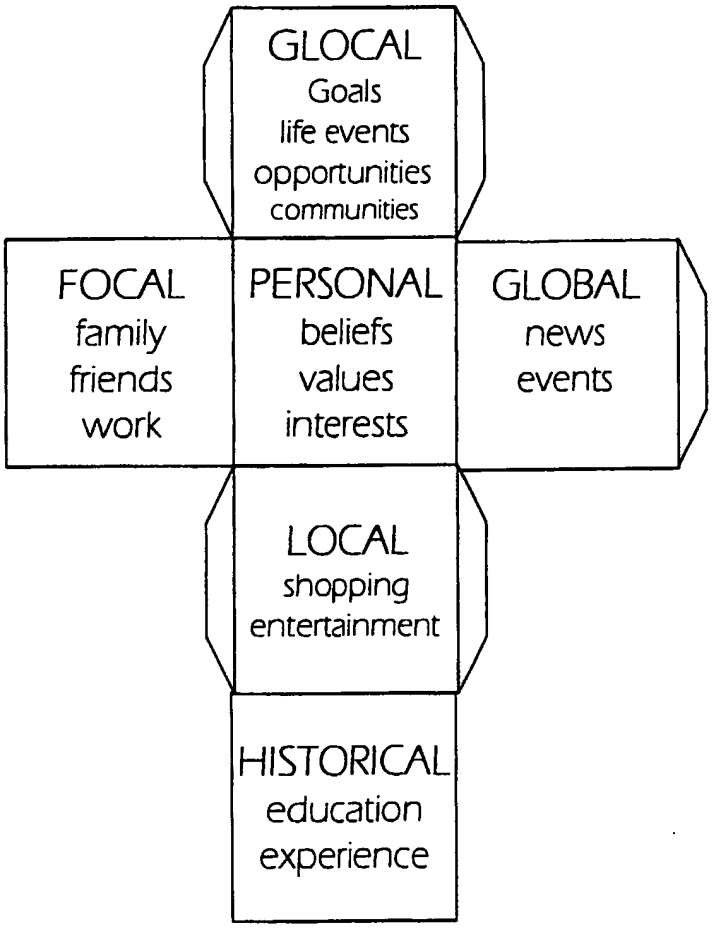
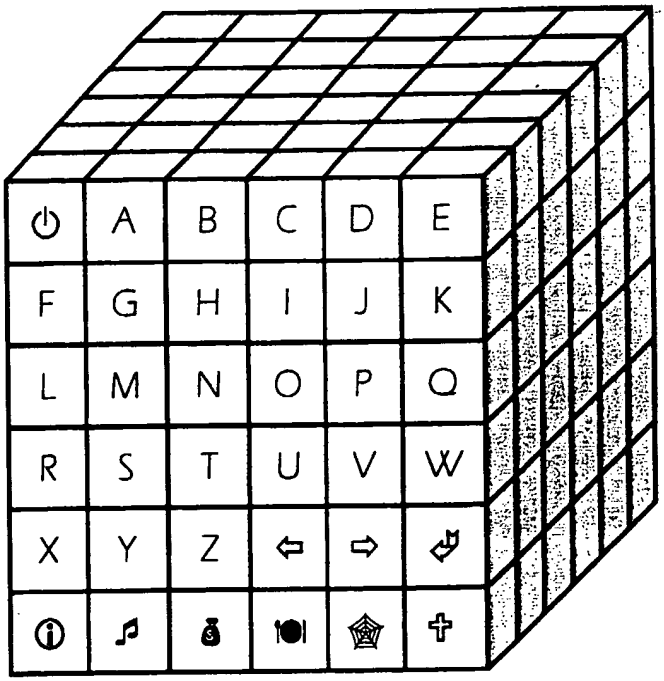


Figure 10

Navigation around Content, Categories, Classes, Dimensions, Devices, Groups and Data Stores



Single Common Navigation Method Across Different Faces By use of Common Cyclical Categorisation

Figure 11

Navigation Around Groups and Multiple-Groups

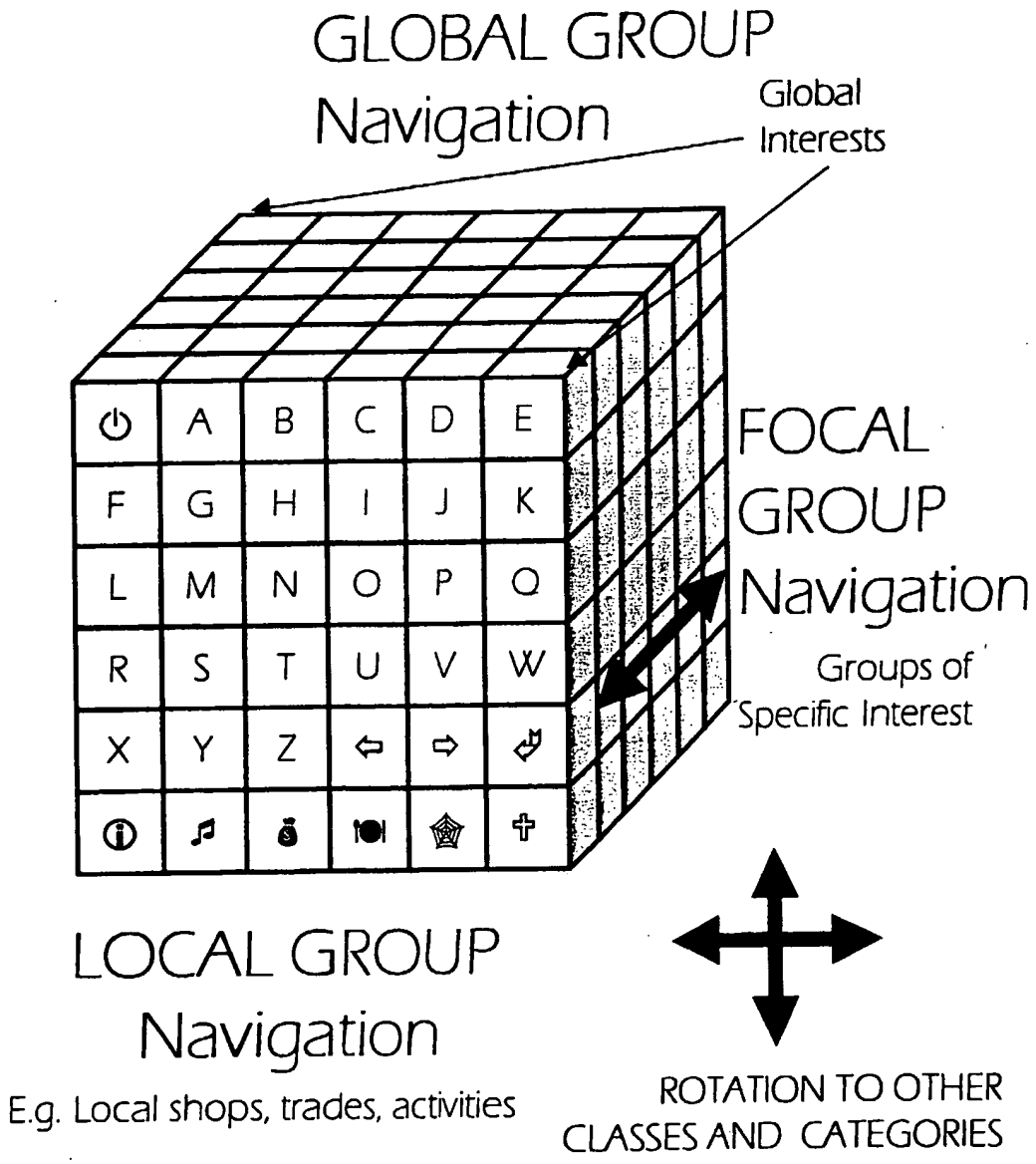


Figure 12
Method and Process for creation, sharing and use of structured multi-group spaces by Cyclical Categorisation

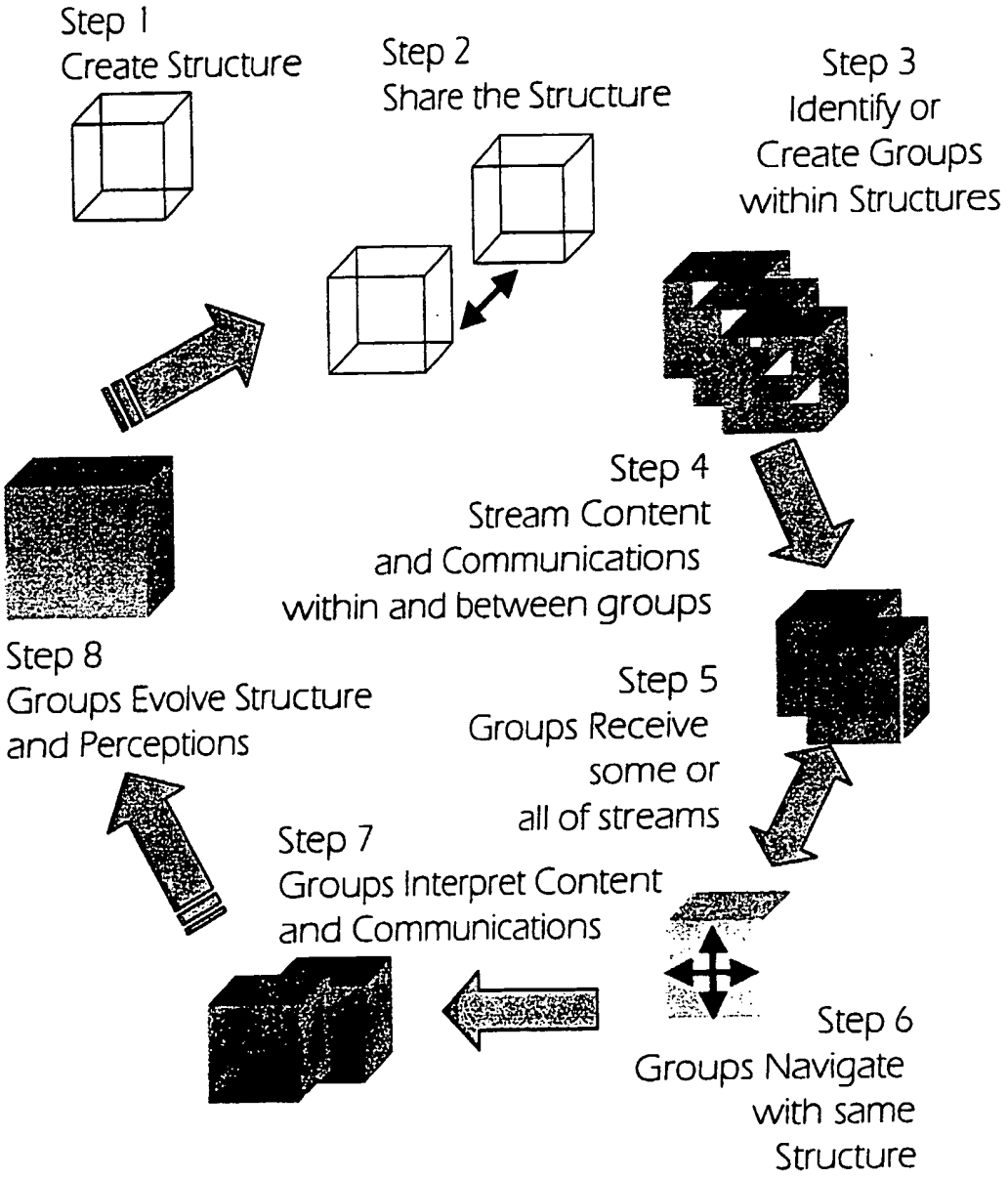


Figure 13

Extension of the Cyclical Categorisation Method and Process to other areas

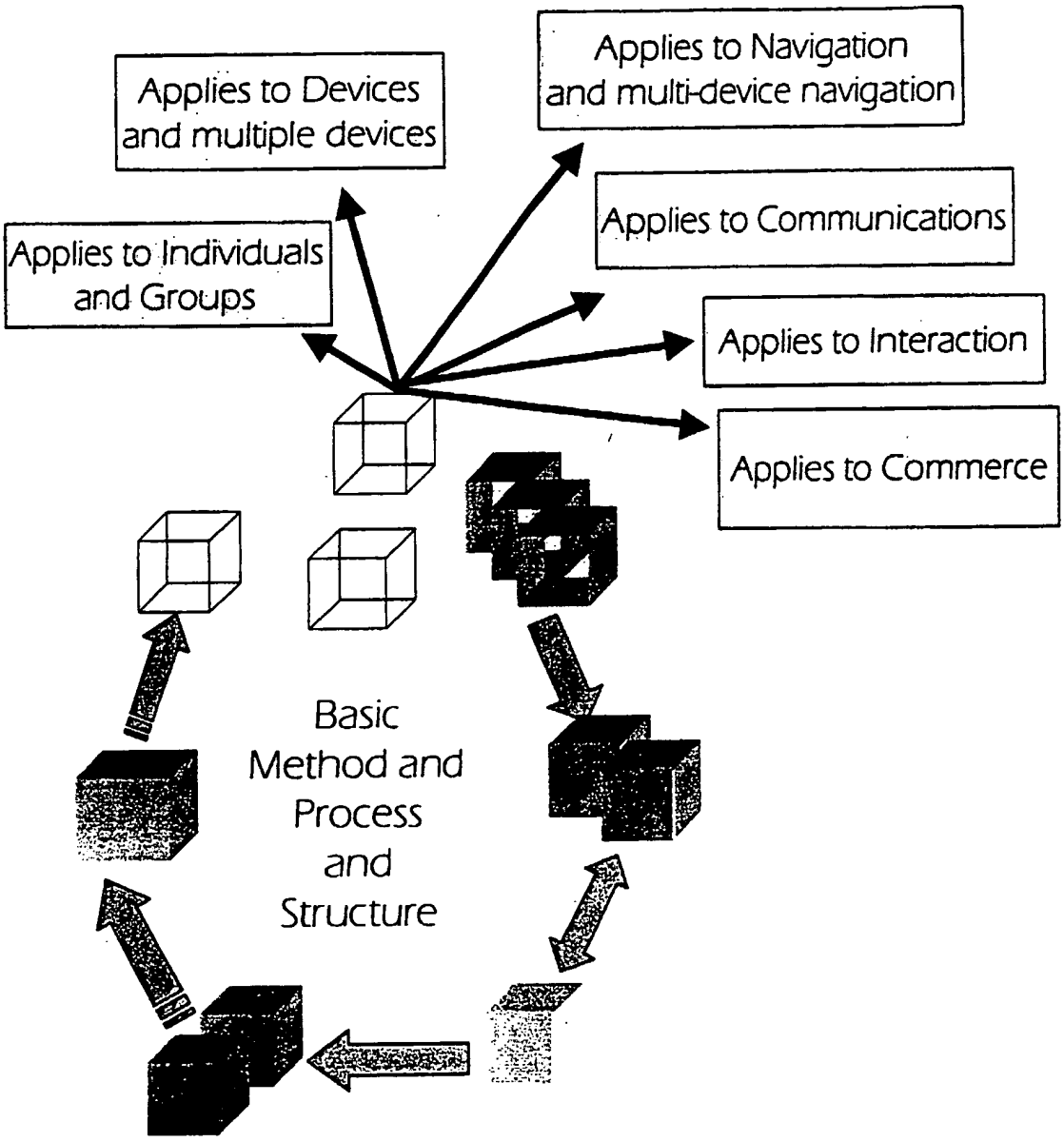


Figure 14

Cyclical Categorisation Methods for Structured Multi-group Delivery and Exchanges

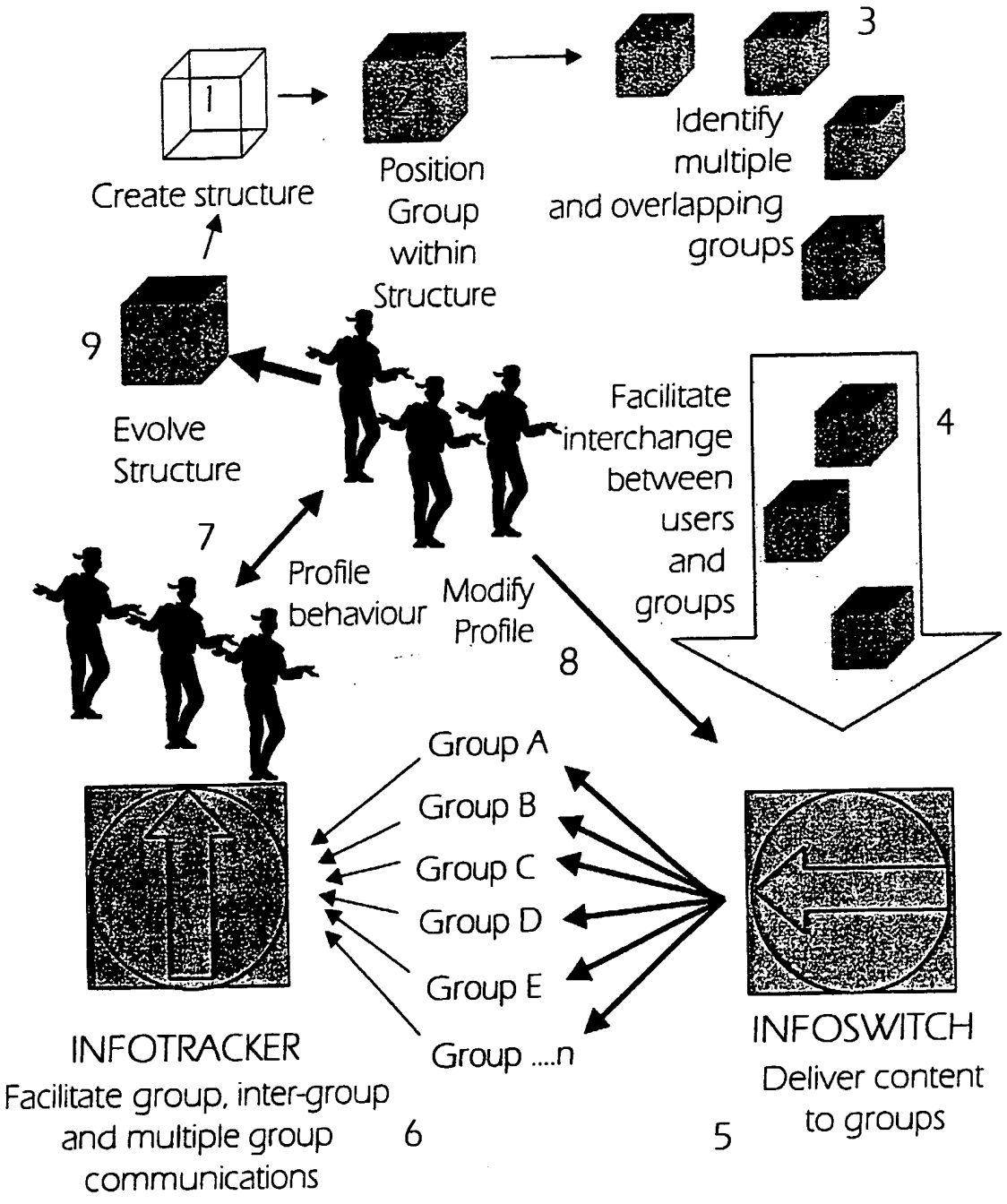


Figure 15

Iterative Database Structures for Privacy and Locality.

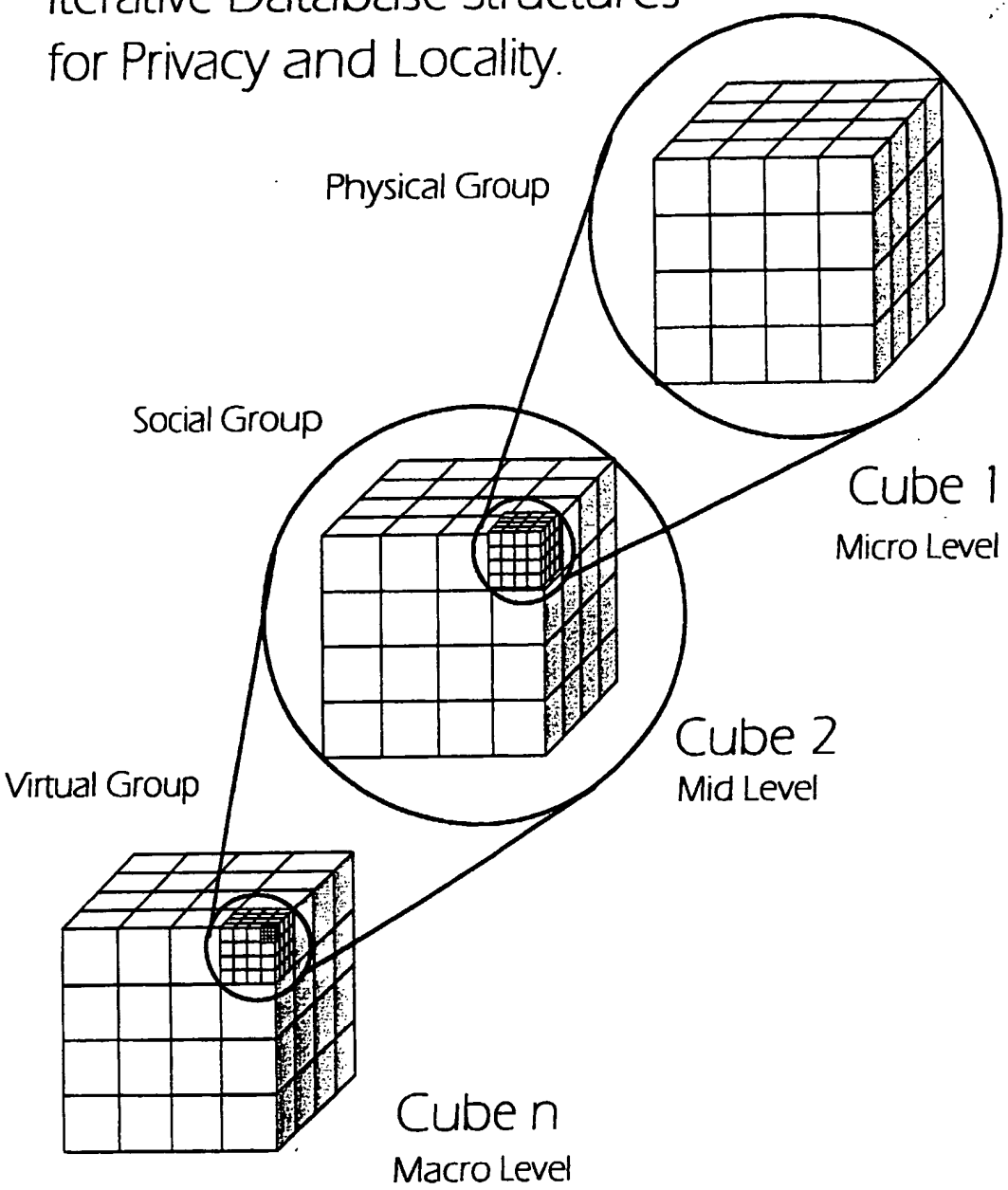


Figure 16

Physical, Social and Virtual Communities.

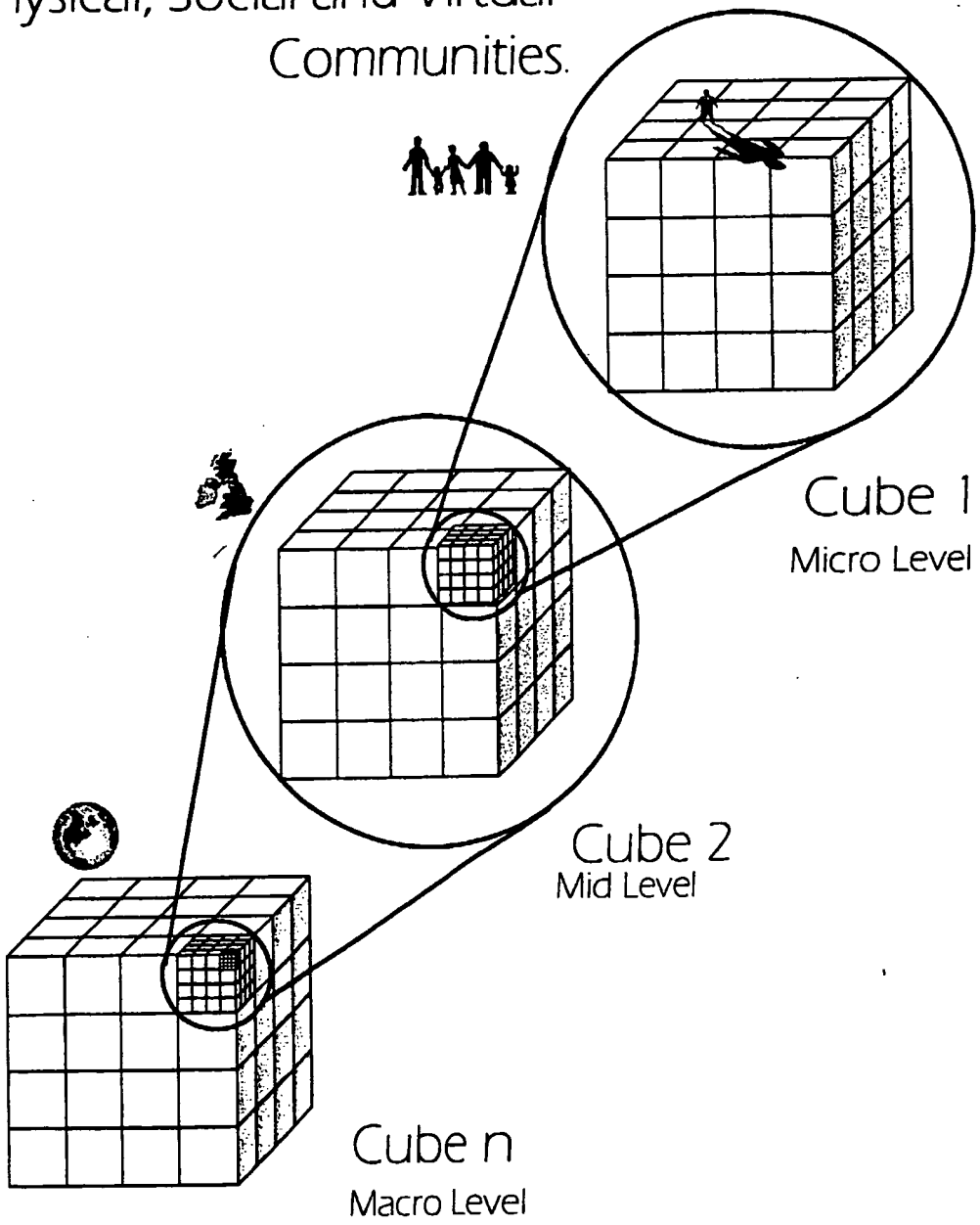


Figure 17

Person, Group and Inter-group Communications.

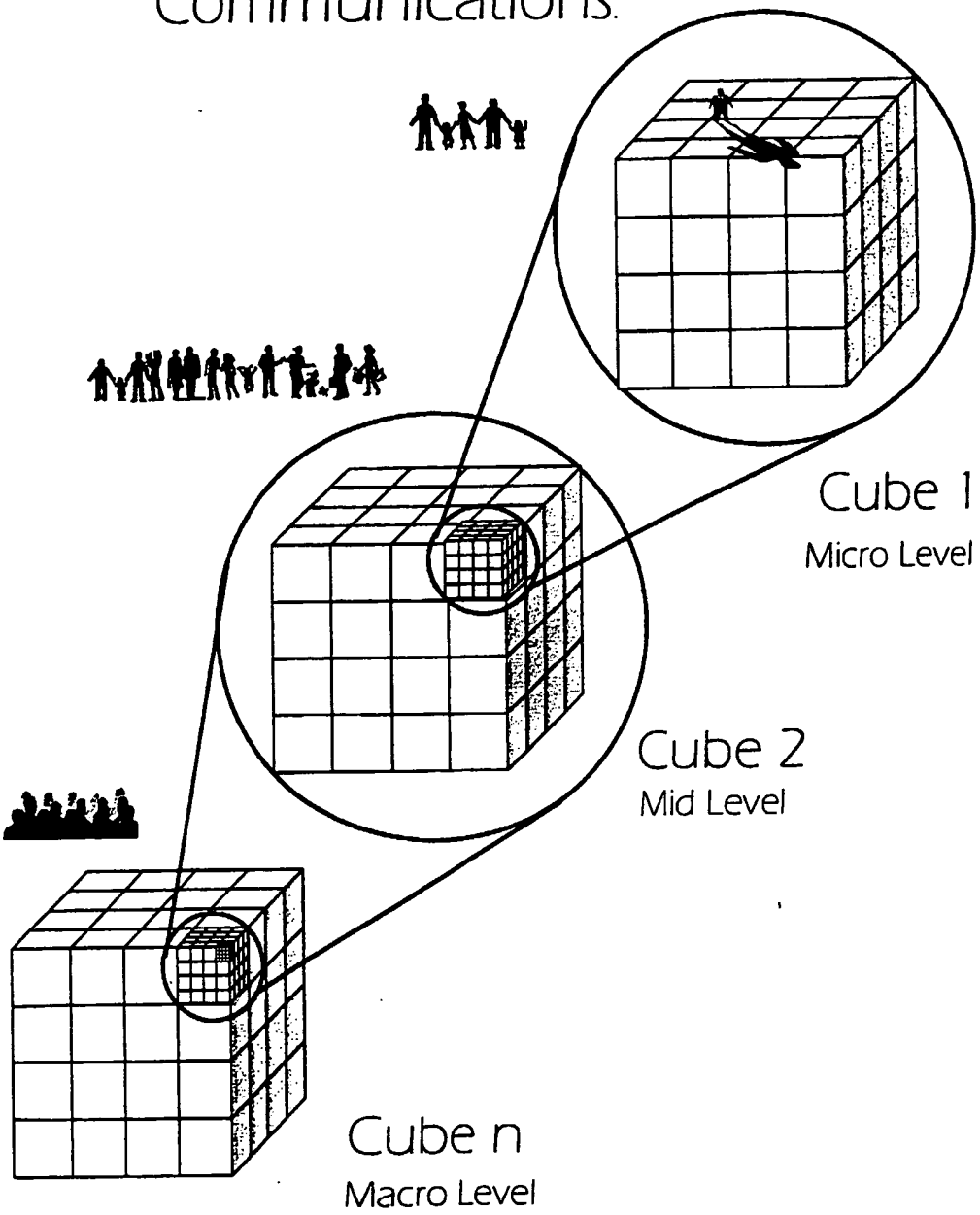
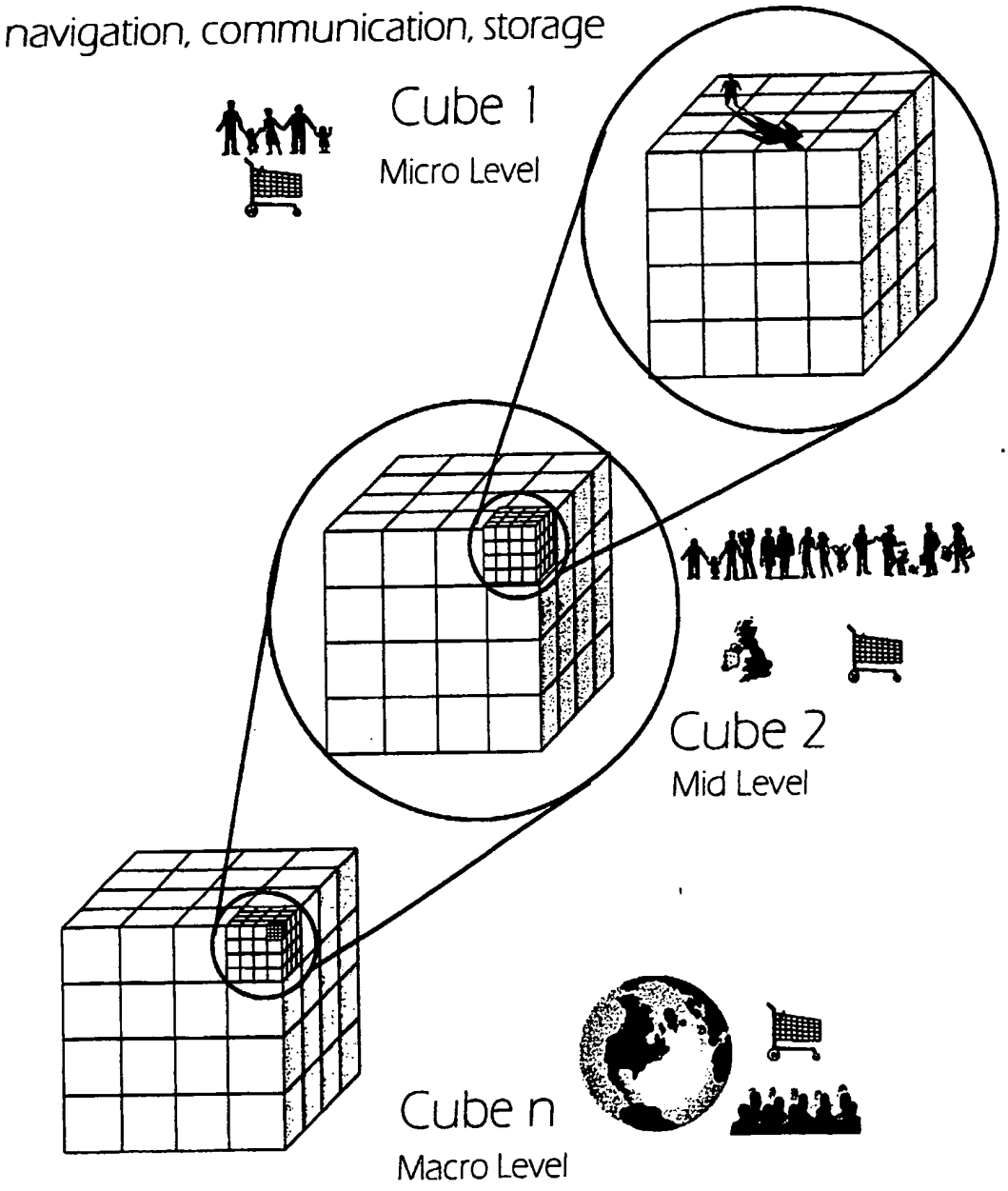


Figure 18

Next Generation Web -

Structured creation, iteration, distribution, navigation, communication, storage



A Method Using Iterative Categorisation Cycles for Multi-Group Multi-dimension Human Computer Content Processing and Communications With Database Linking.

Scope of the Invention

The present invention relates to methods and processes for creating and sharing structured information frameworks, the resulting interchanges made possible by such structuring and sharing between individuals, groups, documents and devices, as well as the communications, community and commerce made possible, together with infrastructure, features, facilities, devices, and knowledge to support same, including but not limited to hardware, software, communications and content.

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Background

Memberships of multiple physical, social and virtual groups are such a dominant feature of human life it is surprising there have been so few attempts to address such phenomena within computer processing schema. This is even more surprising given the level of interest in security and privacy issues relating to the Internet. Knowledge of and communications with other individuals can, as at present, take place in full anonymity, with no correspondence between people, their location, and their electronic address. Contrast this with the Postal Systems around the world where individuals, or roles, and physical locations are tied very closely together. Even the virtual locations of the mail drop have a physical embodiment.

As electronic communications reaches greater majority in some countries of the world there is a need to look again at the addressing schemas in place, to seek to give more confidence in name and addressing conventions. At the same time whilst preserving the advantages of knowledge of physical location, it should be possible to meet at the same time the privacy and security requirements that individuals, organisations and institutions require. Physical location, group and virtual group memberships and electronic communications and transactions need to be tied together in organised structures, which users can navigate around. The current novel method seeks to do this, applying what we know about human cognitive and social processes to the world of computing, communications and virtual interactions in innovative ways. In particular the repeated or cyclical application of categorisation processes is seen as an

important component in the establishment of information, computing and interaction structures.

There have been a variety of attempts to improve navigational techniques within compute databases including Earle 1994 (US Patent 5,359,724), and Pooser and Pooser 1998 (US Patent 5,812,134), but such attempts have little relevance to human cognitive processes where categorises can be multiple and non-hierarchical, as well as intersecting and overlapping. Typically mathematical models and algorithms have extreme difficulty coping with multiple categorisations.

Likewise attempts to provide mathematical methods for determining degrees of similarity have met with only limited success when applied to human cognitive and social processes, e.g. Egger et al 1998 (US Patent 5,832,494). An alternative paradigm is proposed here where the categorisation and grouping is done as a human cognitive and social processes at the outset of the information cycle, not as a post hoc interpretation of some of the features considered salient at any particular time.

With the proliferation of computer systems in so many areas of life we now have in advanced countries a situation where individual details are held in a multitude of databases. With Tax and Social Security records, Health, Home and Bank details all held on different and sometimes incompatible computer systems, no where is there a "picture" of the whole individual. With the sophistication of today's computer systems and their ability to track detailed transactions, many would argue that such a co-ordinated series of databases would be an intrusion on privacy and civil liberties. Even so, the lack of structured frames of reference for organising information relating to individuals, their physical location, personal interests, social and virtual groups hinders interaction, communication and commerce.

Other difficulties of human-computer-content interaction relate to the proliferation of uncoordinated information that comes from Internet searches. A lack of structure across databases means search interactions often produce a multitude of more or less irrelevant links. Just as with the absence of a "whole person" picture from the multitude of database entries, so to is it difficult to gain a "whole picture" perspective on events and activities. Instead we are presented fragments of what is going on. News bites rather than whole stories. In such instances the sheer volume of data can hide the qualitative assessment and organisation of information.

There have been attempts to overcome some of these shortcomings. One approach is to segment large databases, for targeted marketing and promotional activities amongst other things. For example US Patent number 5,636,346 (1997) establishes correspondence links between households on interactive cable networks, and the delivery of relevant and specific information to target households. By using a unique electronic address for each household a degree of privacy is preserved.

Patent WO/22495 (2000) uses sophisticated computing algorithms to determine whether or not specific information should be sent to specific locations as based on geography (or inferred geography) of the receiving device. And US Patent 4,645,873 (1987) establishes method for linking databases with geography in a proposed national database with a plurality of databases each with local information, and with interrelationships between each of the databases, so that individuals can select, to an

extent, the information they consider relevant to them. And sending e-mail information to specific groups of individuals is addressed by International Patent WO 00/20975 (2000).

Although these approaches go some way towards improving the situation, they still deal with the symptoms of the difficulty and not the underlying causes, which in part are the lack of encompassing frameworks and methods for dealing with information, as distinct from data. Indeed, the profound nature of the weaknesses inherent in current information structures can be revealed by even a brief consideration of Internet data transmission methods. Information is transmitted through a variety of computers using Internet Protocol (IP) addresses, yet this is not geography specific and this leads to delays in packet transmission. WO 00/38381 (2000) proposes ways of adding geographic cues to routing to make packet delivery more rapid and secure.

The anarchic approach to networking information which was a design criteria of the Internet, in contrast to the more structured routes followed by telecommunications links, was to make the Internet infrastructure "disaster proof'. Those who designed the Internet could not have foreseen its popularity, and so some of the design criteria are becoming weaknesses. For there to be an evolution in functionality and usability needs an evolution of design features. The database structures that relate to social groups and personal interests is one important area in such an evolution. The present invention is designed to support different types of individual and group interactions within more structured information and communications frameworks.

With the explosion of electronic communication there has been a fragmentation in the naming conventions for electronic communication within an overall loose framework. There are a multitude of addressing schemes with little or no correspondence between electronic location and physical location making delivery and retrieval of geographically and other locally focused segmented services difficult. Administration of such services is also becoming an increasingly high overhead.

The above and other inventions, which propose piece-meal solutions for addressing geography and individual databases cannot, by themselves, realise needed improvements. Attempts have been made to ensure privacy within schemes by allocation of randomly generated numbers, and these go some way to reducing privacy concerns. Yet each of the approaches investigated fails to address the multitude of groups, physical, social and virtual, which individuals are members of. The have been attempts to link content, computing and people in structured and co-ordinated frameworks, for example Ross 1999a, b, c and d. These have addressed the need for a common and unified structure for the different aspects of content, computing and human navigation. Here we go further and apply the repeated or cyclical application of categorisation processes to deliver more sophisticated structures for content, for computing and for human interaction and navigation. The current invention overcomes previous limitations. It addresses the complexities of multiple group memberships in the context of geographic and electronic addressing schemas for tailored delivery of specific content to individuals in specific locations, and for enhancements to the interactions between individuals and groups.

Problem

As electronic communication increases the load on communications infrastructure also increases. Yet much information and a good deal of communications is local in nature. People have an interest in their own locality, its services, shops, transport and weather, as well as episodic difficulties with any of the above. Such information has a timely quality that people want to receive the information in an easy manner. Today's Internet does not meet these requirements. In addition, individuals can be members of many different physical, social and virtual groups, and these membership ties are neglected in computing paradigms. Some computer addressing algorithms address the geographic proximity but not the multiple group membership factors. This either gives rise to unnecessary computing power to tie information and users and users and users together or the co-ordination of individuals and groups into organised schema becomes difficult if not impossible. Using the more advanced addressing schema proposed here with distinctive multiple public address domains co-ordinated and loosely coupled, and with multiple membership of groups a distinctive feature of the structure, method and process, such problems are overcome. The method has other advantages in terms of information delivery, communications and transactions and these are considered below.

Essential Features

A feature of the method is to identify and differentiate the different group dimensions that individuals belong to and participate with, and to link these grouping with electronic equivalents.

- There are physical communities of people interacting on a regular basis. This can include family and friends, neighbours and work groups and local interest groups, for example fitness clubs or hobbies.
- There are social groupings that are an important feature of the identity of many people. This includes religion, race, and country of origin, regional identifications and other social and economic category memberships.
- And there are the virtual communities made possible by the Internet and other electronic devices, involving people who may never actually meet but who nevertheless are a community with a pattern of communication in their own right.

All such communities, and any individual may be a member of many, have patterns of communication and interaction, and they share common events, for example financial success or natural disaster, and common experiences.

Databases tend to be structured from a single perspective, for example an individuals tax history, or the products and services of a single vendor displayed in a web database. It is left to the individual to integrate the various interests, perspectives and databases across their personal and group space. This can be a frustrating experience.

A more integrated approach, such as that proposed by the novel method here, looks at data and information storage, communications and interaction, from the different multiple perspectives of the individual and the multiple group membership. In this

approach the various outputs of the various physical, social and virtual groups are presented within a common schema that is structured for navigation, content distribution, communications and interaction.

Making use of these multiple perspectives, and combining it with a method for creating structured information spaces, the current invention does further and imposes similar processes for structure and co-ordination across primary, secondary and multiple memberships. These structures and processes can be combined with computing algorithms and hardware software and networks, to address a series of requirements in combination. The elements addressed include

- Communication
- Locality
- Privacy
- Community
- Commerce
- Navigation and
- Interaction

This method depends on a structured and random or non-random alphanumeric identifier being tied to an existing publicly available communications addressing schema to provide new addresses. These new addresses can by subcategorised by geographic or family or other classificatory cues. In this application an illustration is provided using a cube as a multidimensional Visual Interface, although other shapes are equally possible.

There are at least two discrete cube addresses: -

- A Physical Cube Address, relating to geographic location, defining a boundary around a region containing a population of users. At a simple level this could be a house and those who live there. These tie directly to geographic cues, for example ZIP Code or postcode, or landline telephone number. This Physical Cube Address is used by those authorised to tie physical and virtual communities together

- A Virtual Cube Address generated to co-ordinate the multiple memberships that individuals and groups belong to. Such a virtual address may be for an individual, or for a family or for some other social group. This virtual address can participate in the variety of databases of different membership groups, to provide an integrated framework from the users point of view. Subclasses of the different multiple addresses define spaces of overlapping and intersecting memberships.

It is the virtual cube address that is used for interactions to give a degree of user privacy. If desired, an individual can reveal their physical cube address to others to indicate the region or space where they live. Those that have a legitimate need, for example fast food services with Internet ordering, or home delivery services to give just two examples, would have access to deeper levels within the co-ordinated databases to plan deliveries and routes. To preserve privacy those that make such physical deliveries may be restricted from knowing the equivalent electronic addresses.

Likewise those organisations wanting to deliver information that has regional, language, social or other characteristics can make user of information contained in both the physical and virtual cube databases to select their target audiences, assuming the recipient has selected to be sent information of the type that is under consideration.

One user may want to link to a series of databases providing a series of categories of information, relating for example to news, sport and weather, whereas someone else may locate themselves within very different categories for example, music, theatre, books and art. The social and virtual spaces of the two would be very different, but there would share an underlying structure and can modify their selections of social and virtual groups as required. Both could navigate the public interest spaces of the other, as visitors to the space of the other group, rather than relating as individuals in their own right.

A cube address, at the micro level, can, if need be, be generated randomly as an alpha and/or numeric sequence. At the outset it is tied to a structured public numeric sequence to provide geographic location cues. Examples of such public geographic location cues would include land telephone numbers and postal ZIP or other codes. These two database elements, the cube address and the structured numeric address are both public address information. The two are linked in additional databases to non-geographic based code generator. This delivers privacy when used without the associated geographic locator cues and security when the two databases are used in combination. Geographic addresses associated with cube addresses can be provided when users authorise such information. Because of the random generation of cube addresses, adjacent cube addresses are unlikely to be geographically close. This preserves a degree of anonymity.

This addressing scheme permits different individuals at the same physical location, as defined by the numeric stream, to use the same cube address and add different names to that cube address for electronic mail and other applications including electronic commerce. This creates a physical group using the same address with different differentiators where this is required. For example Joe Smith, Ann Smith, Chris Smith and Jenny Smith all at the Smith cube address of e.g. AZ3D Y67T. Cube addresses can be independent of service provider as the addresses could well relate to a number of different services across different service providers and networks. Issues of personal liberty may arise with such a scheme but there is nothing to stop individuals setting up a multitude of cube addresses for themselves.

Because of the random generation of addresses different people with the same name are differentiated by different cube address, thereby enabling them to keep their name and using the cube or other address as a differentiator. This is analogous to the use of names and postcodes in the UK to locate families and individuals for delivery of physical mail.

This cube addressing scheme has relevance to Internet names and addressing as it permits easy registration of groups of people whilst still preserving information about geographic locations, without showing this in the cube address.

This method makes it possible to tie people and local communities more closely together using the underlying features of the database. Geographic proximity can figure more easily in provision of information and the support of communications to those infrastructure and service providers who have a legitimate right to know the associations between the databases.

Electronic registration techniques against a predetermined public database mean it is possible to tie together people at the same location even if they register at different times. The method or meta-framework permits streamlined registration and online identification when using electronic interpersonal mail or other electronic transactions including electronic commerce.

This method facilitates information transfer and communications with multimedia formatted content and multi-casting and media streaming to targeted groups and subgroups through and across computer systems, fixed and wireless networks, and voice and information transmissions devices to other individuals and groups at other locations, As the interchange is in a structured format it ensures efficient and effective use of computing and communications through elimination of unnecessary distribution, and focus in the targeting of messages towards audiences that are relevant and have selected their participation.

The method and structure is based on multi-dimensional representations where geographic location as determined by publicly available information classification systems as one of a number of facets of the overall multiple group and thereby multiple database structure and association of the physical location with various forms of electronic address ensures a degree of privacy where required. At the same time it meets the requirements of those people, groups, systems and devices with a legitimate need to know the correspondence between electronic and physical addresses.

The method allows for the allocation of random alpha or numeric or symbolic identifier or any combination of these to one or more individuals, based on their co-location within a physical, social or virtual category space including family ties, with identifiers to those within a particular space, such that members of the same space can communicate with each other directly to aid communications, community and commerce. Likewise other individuals or groups can ensure targeted communications and interaction with such category groups or intersections of such multiple groupings.

The method supports electronic communications and transactions between individuals within the same physical social and virtual groups and within others in other electronic spaces. This ensures information exchange and transactions takes place effectively with a minimum of unnecessary long distance traffic generated when communications does not exceed defined geographic device or other boundaries.

The method provides for interpersonal, person to group, inter-group and information provider to information recipient groups and subgroups communications across a range of diverse information appliances. The base multiple group structures are able to cope with the information delivery from a range of information appliances, including material of an informative, educational, sales, promotional or marketing related nature, or any combination therein.

The method provides for easy and direct communications between members of any home multiple group and membership structure, where "home" refers to all the individuals within a designated structure or location, or family or other group. Such a core group could use electronic notice boards for group-wide delivery of messages as well as more individually focused person to person electronic mail.

The method provides for easy multi-person delivery of structured information to those within defined multiple group and intersecting boundaries, whether these overlap or not. This can be from information providers who seek to communicate with audiences on an occasional or regular basis, using a variety of interactive and non-interactive information appliances to inform them of information, entertainment, events, opportunities and other activities.

Based on the inherent structure of the multiple group memberships the method provides for the identification of communities of interest based on overt or inferred cues, or evolved from self-selection processes, with the sharing of information and communication on a simultaneous or successive basis within and between communities of interest, as well as the delivery of information.

The method provides for monitoring of communications and interactive behaviour, including volumes and other characteristics for billing, and revenue sharing agreements established by agreement with various parties of the electronic space, including the sharing of revenue from advertising, electronic commerce and other forms of revenue-generating opportunities.

The method provides for groupings of users which permits the establishment of individual, family group and multiple group units, to simplify electronic communication within and between groups and improve the delivery of localised or other specific information on an interactive, information pull or push, media streaming or multi-casting manner.

The method provides an addressing structure that is both anonymous and at the same time identified as within a particular physical, social or virtual region or any combination thereof. This facilitates the provision of information and content to groups of people, thereby saving on computer processing power, reducing networking overheads, and making access physical, social or virtual information, from any location straightforward.

As will be appreciated by one skilled in the art, the present invention may be embodied as a method, process, structure, data processing system, computer program product, hardware embodiment or other article of manufacture. It can operate as a stand-alone product or as a component in a network of computers, switches, routers and other devices, and can be separate from or linked and associated with one or more databases of a variety of types, both hierarchical and non-hierarchical. Furthermore, the present invention and derivatives thereof may take the form of computer programme products on computer-usable storage medium having computer-usable program code and may be embodied in the medium with any suitable computer readable medium and networking and inter-networking device. Likewise any computer storage mechanisms, permanent and temporary can be utilised. A computer, personal digital assistant, screen, keyboard and other interactive devices, mobile or

land phone, video conference system, television, consumer device, storage medium and mechanisms can be conceived to facilitate the practices of the method of the invention. It will be understood that such apparatus and articles of manufacture and hardware software and networks also fall within the spirit and scope of the invention.

A number of preferred embodiments of the present novel invention have been described in some detail herein and for those skilled in the art many modifications and variations will be apparent. It is my intent therefore to be limited only by the scope of the appended claims, and not by the specific details presented by way of example and illustration.

Introduction to the Drawings

The present invention will become more fully understood, and the foregoing and other features and advantages of any preferred embodiment will become more readily apparent by describing by way of example only and with reference to the following drawings and descriptions, which are not limitative of the present invention, by which: -

Figure 1 shows the differentiation of multiple group memberships along a series of dimensions, here into physical communities, social communities, and virtual communities.

Figure 2 illustrates the single database perspectives that are common, and contrasts this with multiple database interaction and interlining from the perspective of two individuals, both with multiple and overlapping memberships.

Figure 3 illustrates how different perspectives can be bought together into a single common schema or representation, with associated methods and processes to deliver from a user perspective a more integrated experience with multiple memberships and the associated databases that go with such membership.

Figure 4 illustrates the potential complexity of linking multiple memberships and databases with each other when there is no common frame of reference and information architecture. For example with a number of service providers each providing elements of a service, for example

- PC access,
- TV access,
- Mobile phone access
- Personal Digital Assistant access

The complexities of inter-communication and co-ordination will quickly become almost unmanageable.

Figure 5 shows the benefits of having agreed interface and inter-working standards between multiple database frames of reference and realisation. In this example the agreed standard is a little like the finance world agreeing the Bankers Automated

Clearing Service (BACS) in the UK for the processing of cheques and other financial transactions.

Figure 6 shows different various dimensions of information that multiple groups could use, such dimensions also relating to events of different sorts. In addition these or similar dimensions could relate to classification of the groups themselves.

Figure 7 shows various dimensions of information that relate to experiences of different types.

Figure 8 shows from a users perspective the variety of events and experiences that can be grouped to support organisation, interaction and storage.

Figure 9 illustrates a reference "structure" for groupings of categorisation that can be applied to the events and experiences. Navigation within and across any of the faces would be straightforward and consistent. Such structures, when personalised and tailored by the individual, would reflect individual values, interests, and beliefs as well as group memberships and individual and group experiences and activities.

Figure 10 shows how navigation within and between faces takes place so information about any particular membership, event or activity can be easily retrieved without the need for search algorithms, since information would be structured and organised according to the category labels and identifiers.

Figure 11 shows how navigation occurs within and across faces, with information classified and categorised into the structure of a face and cube. In this example three domains of navigation are indicated

- A Global domain for example world news, business and sports events
- A Local domain for example local news, events, promotions and so on
- A Focal domain for example theatre, or sport, or fishing or horse riding

Rotation of the faces would give access to other domains.

Figure 12 indicates the steps in the method and process for creating shared information structures, the method comprising the following, or evolutions and variations thereof to achieve the same or similar ends: -

1. Developing an iterative method and process for application to and within different components of an information cycle
2. Using said method and process for creating a structure for information categories and classes
3. Sharing said structure between senders, receivers and intermediaries of information
4. Defining and locating groups and memberships within the structure, with the ability for any single member to have multiple representation and occupation within different classes, categories and group memberships.
5. Providing to groups and multiple groups, information sources, streams, or multicast or other delivery technique to populate group categories

and the other structures with information and communication, or to supplement or replace previously delivered information.

6. Using features of the method and process shared by and within the group to navigate around the information structures
7. Groups communicating within their boundaries to understand and interpret the information that is received.
8. Personalising the structure according to further differentiated group needs and evolving the structure and the information distribution streams to populate evolved structures. Evolution and modification of the method and process to achieve similar ends is a feature of the method and process. For example enabling the personalisation and tailoring of information streams, or the combination of different streams for the same or different categories according to group preferences. For example some groups may want multiple deliveries of essentially the same information for different perspectives or interpretations or elaboration or to ensure consistency. For example groups of sports fans may want multiple sources delivering to the categories and classes of interest to them.

Figure 13 illustrates how the base method is relevant to other areas of activity and communication that may affect a group or groups and their memberships.

Figure 14 shows the evolution of the method to track the information receipt and communications and transaction activities of a group. For example the members of a family may have different interests, and communicate with different people, although some overlap of interests and communications can be expected. Each member of the family will therefore participate in multiple memberships. Each individual, over time, may use a variety of devices to communicate, interact and transact with others. At the end of a time period the individuals may settle their accounts individually, or the various accounts could be combined and presented as a single bill comprising content, device access, communications and a variety of other characteristics. Here such group consolidation of usage and spending patterns could be seen as advantageous to the control of family expenditure.

Figure 15 shows an example of multilevel cubes, with three levels shown although there could be more than the three levels indicated here.

Level one is the global "Physical" addressing schema, covering the world or even beyond if necessary.

Level two is a "Virtual" addressing schema where greater or lesser degrees of category similarity or proximity play a part, for example all doctors or all tennis players.

Level n is a more micro "Virtual" addressing schema. An example is of a particular addressing schema covering a group of people at one time sharing a common physical location. This would include a nuclear or extended family, giving a family a single cube address, with privacy protection for individual members contained within the cube structure.

Figure 16 shows how different communities can be defined at each of the levels. Co-ordination of iterative database elements facilitates geographically and other forms of proximate electronic communications, person to person, person to group and group to group, whilst preserving anonymity where needed. This is a factor in helping to build electronic communities.

Figure 17 shows how an individual can communicate with others physically close to them (Micro Level), and with others sharing similar characteristics (Mid Level), and with others at a global level (Marco Level). In each case communications algorithms using the reference framework would permit data interchange to take place along links of communication most suited to the transaction, in terms of speed, cost, capacity and other such features of inter-networking.

Figure 18 illustrates what a structured next generation Web infrastructure would look like, with greater degrees of structure and co-ordination possible than with the Web of today. Here the categories or classes of information relating to various group membership, physical, social and virtual, are easily referenced and navigated, and from a users perspective are presented as integrated along important dimensions rather than being a series of discrete and isolated single perspective views onto a situation.

Examples

This invention makes it possible to exploit multiple group memberships and their associated databases by linking and associating series of events and experiences that are commonly enjoyed together. For example in planning an evening out there may be several linked events and experiences, for example going to the theatre or cinema, going on to a restaurant afterwards and arranging transport to and from and between the events and experiences. By addressing the intersections between these different specific groupings the evening as a whole can be planned.

Likewise if eating in, people want the information about an experience grouped together and presented in ways easy to navigate and interact with. Rather than going to web sites which list every pizza delivery establishment in the region or country and then going to other web sites for different types of food, a person may prefer to interact with a database that lists Chinese, and Indian and Italian and French and other types of cuisine. Further there can descriptions of food and prices and delivery details and even a booking capability. The ultimate service would provide integrated delivery of several different cuisine-types, so one person could have pizza, another Chinese, a third Indian and so on!

An example of the power of multiple memberships and targeting the intersections between overlapping or other multiple groups can be seen when an individual desires to purchase a new or second vehicle. When seeking to purchase a new vehicle the individual joins a virtual group of car hunters and may search for relevant information, and even pay for comparative assessments of the benefits of different types and make of vehicle. As the vehicle is purchased the individual moves from a virtual group to a physical or social group dealing with a vehicle seller, and once the

vehicle is acquired the individual becomes a member of a social group with other owners of the same vehicle. The information and content and communications and commerce requirements change with the changing group memberships, and there are obvious on-sell and counter-promotion opportunities during participation with the different groupings.

The importance of certain dimensions of multiple memberships can take on different levels depending on the overall cultural context. For example in cities where street grids predominate, with horizontal and vertical streets defining blocks of establishments, giving a street number and block number defines very precisely the physical location, and provides a variety of other information as well depending on the degree of stratification within the area. In such circumstances people may prefer to give an apparently random e-mail address, without wanting to sacrifice the benefits of having a geographic element to their information base when this is advantageous.

On the other hand in cities where streets take a somewhat random path and intersect in all sorts of different alignments, there could be advantages to being more explicit about locality. This needs an addressing scheme that is more meaningful to the average person than a ZIP code or postcode, but less than a full street address and house number. Cultural and regional variations can easily be handled within the method and process described here.

An example where linking of discrete database has advantages is that of car sharing. Here several overlaps need to take place. People need to be travelling from the same geographic area, so proximity dimensions become important. The Physical Cube addressing schema provides this. They may need to be travelling to the same place of work, at the same time, and so social memberships come into play. And if the journey is going to take significant time it may be important they share some important values, beliefs and interests so virtual memberships are important. Having acceptable degrees of synergy between the multiple memberships helps ensure compatibility and communications.

Moving house is another example where multiple memberships and their associated databases come into play. If moving location then the physical groupings become important. Information will be required about facilities and characteristics of the location being moved to. This could include job searching for one or more members of the group moving, requiring access to groups and databases of the social and virtual variety. And communications to different groups in both locations, moving from and moving to, will be important in arranging the legal and logistical requirements of such a move. Once the move has taken place certain of the groupings important in the interim phase will lose their importance. This is an important characteristic of multiple memberships as they are by nature dynamic not static.

Examples where local dimensions are important include local news, weather and travel, local entertainment and other local facilities. Indeed any interactive human – computer activity can to extent depend on information of local relevance e.g.

- Friendship clubs.
- Classified ads for jobs, cars, second hand goods and so on.
- Local shopping, including delivery of goods ordered electronically.

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Claims

Having thus described my invention, what I claim and desire to secure by patent is:

1 A method and process and structure for information, content, navigation, communications social interaction, and group memberships where elements and their interrelations are multiple, overlapping and intersecting with respect to the creation, processing, distribution, navigation, action and storage of data and information exchange and communications between individuals, groups and multiple groups, comprising

mutual and shared systems of classification and categorisation between senders and recipients of information,

the grouping of categories within boundaries within and along dimensions of distinctive difference,

the population of categories from streams of data and information elements that have been given one or more classifications within overall shared structures at source or before reception,

the distribution of the structured data, information, content and communications to a range and variety of different devices such as to maintain a family resemblance of interface, processing, navigation and action across said devices.

the representation, linking and embodying in software hardware networks and communications the multiple memberships of individuals in groups of all types including physical groups social groups and virtual groups such that the representation association and inter-working of the multiple and overlapping groups and their associated separate and combined databases provides a structured representation and visualisation framework within and between these and other databases so supporting association, navigation, communication and commerce within ad between the multiple groups and their memberships therein.

2 The method and process and system of Claim 1 further comprising the steps of classification and multiple classification of individuals into groups Superordinate groups and subordinate groups and subgroups along a variety of dimensions including physical groups social groups and virtual groups also comprising dimensions of multi-dimensional "faces" of events experiences and other groupings and the linking of the different representations and associated databases to provide integrated user perspectives of their multiple membership faces and classes, such faces and classes being groupings of categories.

3 The method and process and system of Claim 1 further comprising the association and linking of the multiple group memberships and the associated

databases and the physical social and virtual worlds with defined boundaries and classes and groups and the association of these representations with a multidimensional electronic representation of these distinct but associated worlds divided into distinct areas or regions with an associated random or non-random tag or identifier to maintain where required and so far as is practical user identifies and locations within these different bounded areas

4 The method and process and system of Claim 1 further comprising the steps of electronic communications within and between the members of any one group or overlapping or intersecting subgroup irrespective of any other memberships such that the communication to any group subgroup multiple group or intersecting group uses the selected cues and associated geographic and other cues for direct and targeted communication

5 The method and process and system of Claim 1 further comprising the steps of electronic content delivery or media streaming or multicasting within and between the members of any one group or overlapping or intersecting subgroup irrespective of any other memberships such that the electronic content delivery or media streaming or multicasting to any group subgroup multiple group or intersecting group uses the selected cues and associated geographic and other cues for direct and targeted delivery.

6 The method and process and system of Claim 1 further comprising the steps of physical social or virtual electronic commerce within and between the members of any one group or overlapping or intersecting subgroup irrespective of any other memberships such that such electronic commerce to any group subgroup multiple group or intersecting group uses the selected cues and associated geographic and other cues for direct and targeted delivery.

7 The method and process and system of Claim 1 further comprising the steps of mapping any one physical social or virtual group or overlapping or intersecting subgroup irrespective of any other memberships such that the underlying networking and communications infrastructure uses the selected cues and associated geographic and other cues for direct and targeted delivery of content communications commerce interaction and navigation to optimise delivery and avoid unnecessary indirect routes.

8 The method and process and system of Claim 1 further comprising the steps personalisation of the structure and representation of any one group or overlapping or intersecting subgroups my modifying the separate and overlapping category domains to bring some to the foreground and others to the background under user control including the tapping into media streams from media streaming and multicasting directed generically or towards specific groups, subgroups, overlapping groups or intersecting groups.

9 The method and process and system of Claim 1 further comprising the steps making available the membership of any group or overlapping or intersecting subgroup for communications and content delivery for the purposes of targeted promotion and counter-promotion marketing advertising electronic

shopping electronic commerce and other forms of revenue generating and sharing opportunities.

10 The method and process and system of Claim 1 further comprising the representation of different groups subgroups overlapping groups and intersecting groups along a range of different dimensions to enable a user to navigate and interact with material content and communications of the various multiple groups in an integrated manner and under user control to modify and evolve the structure and personalisation according to individual preferences.

11 Multi-group categorisation communications content distribution commerce navigation and interaction using association of the group database separately and together substantially as described herein with reference to Figures 1 – 18 of the accompanying drawing

INVESTOR IN PEOPLE

Application No: GB 0113616.7 **Examiner:** Michael Prescott
Claims searched: 1-11 **Date of search:** 27 November 2002

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Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T):

Int Cl (Ed.7): G06F 17/30

Other: Online databases: EPODOC, JAPIO, WPI ; the Internet

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X, E	GB 2359443 A	(Gordon Ross) see whole document	1-10
X	GB 2352940 A	(Gordon Ross) see whole document	1-10
X	WO 99/64970 A1	(Boardwalk AG) see overview on pages 9, 10 and sections on user's contacts and company contacts	1-10
X, E	WO 02/01419 A1	(Quark, Inc.) see summary on pages 2, 3	1-10
X, E	WO 01/97088 A1	(Orion's Belt, Inc.) identifying links between two or more parties by intermediate commonalities - note page 16	1-10

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.